GREAT WORK BY PLUGS IN AIRPLANES

Tremendous Demands Made on Them, but They Came T. ough Admirably.

With the peacetime flights of the American airplane drawing the focus of the spotlight that is thrown on the most spectacular feats, AC spark plugs were afforded an opportunity to distinguish themselves in a comparatively new field of achievement during the year 1919.

These plugs, which are seasoned laurel winners on the road racing course and the automobile speedway, proved just as dependable in the sparking of airplane engines, as evidenced by the fact that new world's altitude records for triplanes and seaplanes were established during the past twelve months by AC equipped aircraft.

In the realm of the air, the most notable accomplishment in which ACs participated was the climb with Roland Rohlfs and the Curtiss Wasp to the roof of the world, six and one-half miles above the ground, this intrepid pilot depending on ACs to spark the 400 horsepower engine that carried him to a height of 34,610 feet.

In this flight the plugs were called upon to function under the greatest of temperature differences, the motor's tremendous explosive heat being at one end, while the temperature was as low as 44 degrees below zero at Rohlfs's highest point of climb. Despite the unparalleled severity of this test, neither a miss nor a cracked porcelain was noted, according to the pilot.

Caleb Bragg, who switched his allegiance from automobile racing to aeronautics after winning the American Grand Prize at Milwaukee in 1912, added another world's record to the AC string when he soared to a height of 18,200 feet with his seaplane.

AC plugs also were used in the Loening monoplane, which flew from Mitchell Field to Hog Island, a distance of 101 miles, in 35 minutes, an average of 180 miles per hour and the fastest official time ever made by airplane, the trial being conducted and observed by the aeronautical department of the United States Navy.

In the sensational transcontinental air derby, Lieut. Alexander Pearson, Jr., who piloted an AC equipped plane, is credited with making the fastest actual flying time on the trip from New York to San Francisco and return, while Lieut. B. W. Maynard, the flying parson, switched to AC plugs on his final hop from Nebraska to Mineola Field.

Incidentally, AC spark plugs, together with the Liberty aviation engine, scored heavily in a sphere of endeavor other than the air when Miss Detroit III. captured the gold cup, emblematic of the American power boat championship, in the Detroit River regatta last August.

A sister boat, Miss Detroit II., also equipped and Liberty engined, was runner up to the winner, while Gar, Jr., took premier honors in the cabin cruiser class.

WILLYS FILLS NEEDS OF HOUR.

Efficient Light Car Answer to Transportation Call.

"Light weight with power, durability and road comfort is the demand of the day in automobile construction," says John N. Willys, president of the Willys-Overland Company.

The demand for efficient automobiles is greater than ever, in Mr. Willys's opinion. "There is," he says, "the increasing need for more transportation. Railroads all over the country have been hard pressed to provide the necessary facilities. The automobile must supplement the rail service. The street car systems in most cities are experiencing the greatest difficulty in maintaining proper service and almost without exception they have been compelled to demand much higher revenues for their service. Business is expanding enormously everywhere. This is its speed up era. As a result the automobile has come into greater use than ever before. It is to-day as necessary as the telephone.

"The trend of the times is toward cars, therefore, of greater usefulness and economy. All of these demands, as I see it, point unmistakably to the day of the efficient light car.

"It was because of the nation's transportation needs and the particular automobile requirements each community presents that Overland 4 was conceived. The basic feature of its construction was realization of the fact that to secure big car riding qualities on a small car wheelbase a new spring suspension was needed. The result is that the new suspension has been provided—the creation of three point suspension, triplex springs for Overland 4.

"But our work did not stop there. We aimed for simplification of design providing in itself a high quality of steels and metals, a protected accessibility of parts and an assured endurance of construction."

WHY LAFAYETTE IS AN EIGHT.

White Says This Type Best Meets Varying Conditions.

The engine that powers the new Lafayette, which makes its debut at the Commodore Hotel, is an eight, and the inner circle of motordom are justified in saying: "I told you so."

For there was an early suspicion abroad that D. McCall White would select an eight for his post-war car, built by the Indianapolis company, headed by Charles W. Nash, in view of the fact that Mr. White's American fame is based primarily on his connection with the eight cylinder Cadillac, and that he is an ardent advocate of high speed and flexible motors as well.

"The eight is the most difficult of all engines to design, and there's a world of satisfaction in doing a difficult thing and doing it well, as I have tried to do," said Mr. McCall.

"Moreover, the eight affords more opportunity for worth while development than any other type of engine yet conceived. Compared to the four and the six, it is still in its infancy despite the meritorious performance that has marked its five years of general service.

"Being the simplest multiple of the four, the eight shares with the engine of half as many cylinders several advantages. It has, for example, the short and rigid crankshaft of the four. In the eight of any given size, however, the crankshaft is even shorter than the crankshaft of a four of equal capacity.

"Compared to the most advanced type of four—the dual valve—the eight can be designed to develop equally as much speed and power, while it possesses greater flexibility and has considerably less tendency to vibrate.

"Because of the shortness of its crankshaft, the eight is the most rigid type of engine that can be built. Shaft whipping and torsional vibration can be reduced in it to the minimum. Eight cylinders, too, are the fewest number that will give proper uniformity of torque.

ONEIDA CO. INCREASES FACTORY

Ground has been broken for factory building No. 2 at the plant of the Oneida Motor Truck Company, Green Bay, Wis. The present building also will be extended to give the company approximately 300,000 floor feet. The erection of the additional buildings was made urgent by the great increase in Oneida sales and the large number of dealers taking on the new Oneida line, which now embraces five gasolene models and an electric truck and an industrial tractor.

PACKARD 7 PASSENGER BROUGHAM PIERCE ARROW TOURING

STANDARD CO. IN BIG EXPANSION

President Cannot See Any Such Thing as "Point of Saturation."

Among other large additions to established enterprises accomplished this year by the automotive parts people are new factories of the Standard Parts Company. A 300 per cent. increase in the spring production of the company's factory at Flint, Michigan, is provided for by the erection of a completely new plant.

Extensive additions have been made also at the company's Pontiac spring plant, where for much of the summer a large amount of work was carried on in tents. In other divisions, including axles, bearings and rims, factories of the Standard Parts group have for several months worked at top capacity.

The Standard Parts Company is preparing for a still larger production in all divisions for 1920.

President Christian Girl foresees practically no such thing as a "point of saturation" for the automotive industry, though he does believe that the factor of competition in the trade will be greater as time goes on. At the same time the opening up of new territory, extensive road building, the increased use of motor cars and trucks in the everyday life of both city and country, and our rapidly increasing population, will, in his opinion, require a greater production than has yet been reached to supply the yearly demand.

The diversity of its products and the large output of its dozen or more factories enable the Standard Parts Company to make the unique claim that its goods will be in practically every complete car and truck exhibit staged in this year's motor shows.

It simply means this—that by reason of being manufacturers of axles, bearings, springs, rims, tubular parts, forgings, and rod assemblies, the Standard Parts factories contribute at one point or other to the building of ninety per cent. of the motor cars, trucks and trailers produced in this country. For some cars they build axles, for some springs, and so on. Such well known trade names as Stanweld Rims, Perfection Springs, Stan-Par Axles, and Bock Bearings belong in the Standard Parts group.

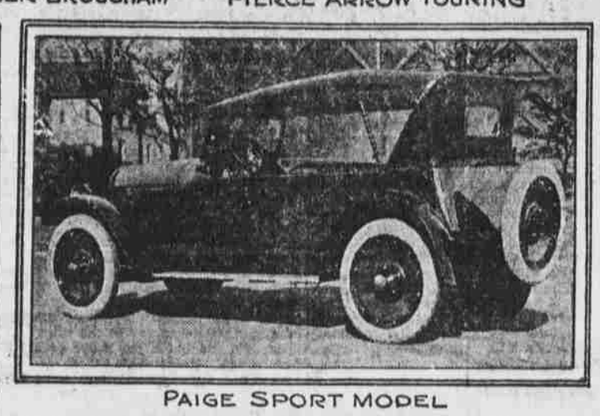
The company, whose headquarters are in Cleveland, is headed by Christian Girl, a leading figure in the Motor and Accessories Manufacturs Association.

STUTZ IS BUILT STURDY.

Designing an automobile so that it will look well, run well and most of all wear well is really a task—particularly on the wear well feature of this programme. Many manufacturers design to "sell well" and trust to luck for the remainder. Harry C. Stutz, well known automobile engineer of Indianapolis, in presenting his new H. C. S. Special to public view for the first time in connection with the New York automobile show also announces his creed—that the real business of a piece of machinery is to work well and to wear well. Then, he declares, he designs beauty and simplicity around these fundamentals. The fact that Harry Stutz is known as a designer of motor cars that "stand up" adds much to the creed in the estimation of the discriminating motorist. The new H. C. S. is being shown at the Hotel Astor.

NASH FOUR IS POWERFUL.

Engineers who designed the new Nash Four declare its perfected valve in head motor to be unusually powerful and flexible. The motor also, because of its construction, is economical of gasolene consumption and is quiet.



PAIGE SPORT MODEL

NEW CASE CARS HANDSOME.

Sturdiness Also Characteristic of These 1920 Models.

Balance and service are the fundamental principles of the new model V line of Case automobiles that will be on exhibition at the auto show. The Case "all feature car" blends with distinctive beauty of design a sturdy power that assures dependability.

Back of the Case car stands the reputation of the J. I. Case Threshing Machine Company, for more than three-quarters of a century recognized as a leader in the mechanical world. Associated in the production of the Case Six are twenty-four of the best known and most responsible names in the automobile industry. This combination of talent backed by the whole weight of the Case reputation guarantees in the Case a degree of excellence never before approached in a motor car at so moderate a price.

Leading the Case line are the coupe and the sedan, wherein refined elegance finds its greatest expression. The coupe accommodates four passengers with plenty of room to be comfortable. There are two individual seats in addition to the full width rear seats.

With roomy front and rear seats in the sedan and two auxiliary seats which disappear into the back of the front seat, this all season car comfortably seats seven.

The seven passenger touring and four passenger sport models are also on exhibition. Both of these models carry the stamp of Case dependability, balance and artistic design.

BIG STEWART GROWTH.

One of the Leaders After Seven Years.

Nearly eight years of motor truck building—from an insignificant beginning in 1912 to one of the world's largest exclusive makers of motor trucks—is the record of the Stewart Motor Corporation, Buffalo, manufacturers of Stewart trucks.

When the first Stewart truck was built in 1912 there were 154 truck manufacturers in the United States. To-day but thirty-six of those original companies are in existence.

The remarkable success is mainly due to the Stewart policy of building trucks of the best quality in large numbers. Those sold during the first year in the company's history are still on duty and serving their original purchasers.

The enormous growth of the Stewart company made larger quarters necessary, and a new nine acre plant was added to the company's property, which will make possible a 10,000 truck production during 1920.

Velie Relieves Food Shortage.

More country produce is carted to New York City on Velie motor trucks than on any other trucks. Hundreds of these trucks are met on Long Island roads going to market, showing that the farmers are motorizing their haulage to a remarkable extent in this section.

YOU CAN DETECT ENGINE TROUBLES

Because Every Little Sound Has a Meaning of Its Own.

"Perhaps the most delicate problem that the amateur automobile driver has to deal with is that of distinguishing between and locating various engine knocks," says William H. Stewart, Jr., president of the Stewart Automobile School.

"While there are numerous 'listening' contrivances on the accessory market, experience is, as always, the best teacher, and it will enable you to locate and repair the faulty part before it develops into serious trouble. Some of these serious knocks are the following:

"The more experience you have in listening to 'engine talk' the more expert you will become in discovering and telling exactly what is loose. Each part not functioning properly has a peculiar sound which usually comes in regular periods relative to the speed of the engine.

"A loose connecting rod produces a sharp bump or a very heavy hollow sound. To locate this run the engine slowly and cut out the cylinders in turn. If a rod happens to be very loose the knocks can be detected by revolving the engine with the hand crank. This trouble is caused by a loose, scored or burnt out bearing.

"The main bearing knocks are readily located by running the engine on two cylinders at a time, one on each side of the crank bearing. A hard bump will be noticeable throughout the engine, produced regularly with the firing of the two cylinders. Such knocks are caused by end play in the shaft, loose fitting bearings, or scored or burnt out bearings. In the latter two instances the engine will usually groan when it is started cold.

"A loose piston pin is distinguished by a sharp metallic knock. It can be located by using the 'listening rod' upon each cylinder and speeding up the engine suddenly, then closing the throttle quickly. By so doing a double knock is heard which is very sharp and which might be better termed a rap. These knocks are caused by a crooked or a broken pin, or perhaps a tight or badly worn member.

"A loose crankshaft is seldom encountered. It gives a rattling slap combined with a thud. In some cases only the thud is audible; in other cases the looseness of the bearings will allow the gears to slap and rattle. Generally this trouble is very hard to discover, due to the pressure of the valve springs. The trouble can be located, however, by sounding the gear case and cam shaft bearings with the 'listening' apparatus. The knocks are caused by loose bearings, end play or badly fitting bearings.

"A loose flywheel will produce a very heavy knock at low engine speeds and appear regularly. The knock will change its nature entirely when the engine is speeded up, and the vibration of the shaft will produce a dull chattering knock. It is located by disengaging the clutch and rocking the flywheel back and forth. The trouble is caused by improper fitting, loose bolts, broken bolts or bad keys.

"A loose piston gives a very short knock similar to valve slap, the clearness of it varying with the size of the cylinder and metal used in the piston. It can be located very easily by the use of the 'listening' apparatus' held against the cilnder wall. It is caused by a large bore, small piston or eccentric member.

Allen "43" Performs Well.

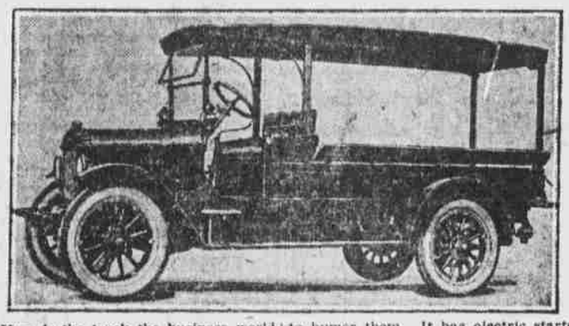
The entire energy of the entire plant of the Allen Motor Company at Columbus, Ohio, is concentrated upon the production of one chassis model. Upon this chasis are built their regular five passenger touring car, three passenger roadster and one enclosed model, the sedan. In addition to the standard finish cars on display, is one finished in ivory and nickel with wire wheels, lending "showiness" in the display.

This is the Allen's seventh season. During all this period the company has adhered to the production of a moderate sized car with a four cylinder power plant.

During the last two years, however, Allen, who builds its own power units, developed an entirely new motor and made many changes in body lines and other car details.

The present car has already established some very creditable performance records. In hill climbing tests up the celebrated Uniontown Hill in Pennsylvania the car negotiated the stiff three mile grade on high, breasting the top at over thirty miles an hour. The record is matched by only a very few cars, all of which are much larger and of higher power rating. Engineering data show that the Allen motor has reached the very unusual accomplishment of developing maximum power and economy over a very wide range, twelve to thirty-six miles an hour car speeds.

New Stewart 2,000 Pound Delivery.



Here is the truck the business world has wanted, the Stewart 2,000 pound Delivery. The market has been ready and waiting. This is a truck made to meet a popular demand. It is not a remodelled passenger car, but designed from the ground up as a truck, by expert truck manufacturers who have demonstrated their ability and the quality and economy of their goods by winning world leadership in seven years.

This new car travels on five inch cord tires and is intended for quick delivery runs—to get there and get back, and for the heavier hauling from depots and warehouses.

Because good drivers are scarce and high priced, this new Stewart is made to humor them. It has electric starter and electric lights. It carries out the Stewart policy of simplicity—all useless parts eliminated. It will prove its value in muddy and sandy country, as well as city streets.

The Stewart one ton delivery truck is built in both open and covered express models. It is built on the same principles as the three and a half ton Stewart, only smaller. In addition to electric starter, electric lights and five inch cord tires, please note the following features: real truck rear axle, cast tank radiator, front bumper, rebound plate on all four springs, upper windshield swings for rain vision, lower for ventilation, oilless bushings and few grease cups, completely equipped at a popular price.

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A few weeks ago the Stewart factory at Buffalo shipped 71 Stewart trucks abroad, 51 of them going to Cape Coast, Africa, and 20 to London, England."

At the present time the Stewart Motor Corporation has distributers in the leading cities of twenty-seven foreign countries.

CUBA USES SOME CARS ON TRACKS

Sugar Plantations Equip Cars With Flange Wheels for Fast Work.

Cuba sugar plantations have introduced the "automobile railroad." As usual, an automobile dealer is responsible for the innovation, which, incidentally, has proved so thoroughly practical and economical that it promises to become general throughout the island.

The plan consists simply of laying the ordinary railroad track and equipping motor cars with flanged wheels. Brouwer & Co., Dodge Brothers, dealers in Havana, made the suggestion to a large sugar grower after studying his problem of transporting labor over the vast expanse of roadless land which constitutes his plantation. It was apparent to the sugar grower for some time that the old fashioned cart and mule were no longer in keeping with the modern idea of transportation efficiency, not to speak of the heavy losses annually entailed through these cumbersome methods. However, the condition and size of the plantation was such that road building was out of the question. Consequently the "automobile railroad" proposal was welcomed with an enthusiasm that called for immediate action on the part of Brouwer & Co.

By the time the track was laid a Dodge Brothers screen side business car had been equipped with the necessary iron wheels and a seating arrangement accommodating ten persons. To avoid the necessity of installing turntables and other apparatus common to railroads, the car was also equipped with a double transmission by means of which it is possible to run it backward as fast as forward. The entire arrangement was more than satisfying, with the result that the idea has been patented by Brouwer & Co. and the demand for similar cars for use on railroads recently constructed or under construction has become almost general. At the present time fifty such cars are being specially equipped for railroad use.

About the time the first car was completed, another sugar grower was preparing to begin the operation of a sixty-five mile railroad he had built from his plantation to Havana, for marketing purposes. War restrictions, however, forestalled his original purpose of using steam or electric power and other regular railroad equipment. He heard about the Brouwer plan and immediately installed one of the automobile trains. He finds that the pulling power is ample, that the operation costs are greatly below the figure he had estimated for the other equipment and that the arrangement on the whole is eminently satisfactory. The result is that he has begun to lay tracks over his entire plantation, with the idea of using motor cars permanently for all his work.

In addition to the standard screen side business car of ten passenger capacity, the Brouwer company has built a fourteen and sixteen passenger bus on lengthened Dodge Brothers chassis and has coupled to this a standard truck attachment and a trailer, making a combination passenger, baggage and freight train of considerable hauling capacity. One of the largest users of the new automobile railroad equipment is the Ferrocarril del Norte, which has twelve of the cars in operation.

STEWART'S RIG FOREIGN TRADE

Truck Corporation Has Representation in 27 Countries.

Motor truck manufacturers these days are giving serious thought to the foreign end of the truck industry.

During the period of the recent world war truck shipping to foreign lands was more or less a hazardous undertaking, but since the U-boat menace has passed into history American made trucks are again taking their place on the map in all parts of the Old World.

"In the vast majority of cases," says T. R. Lippard, president of the Stewart Motor Corporation of Buffalo, "motor trucks made in the United States can be sold in foreign lands at a lower price, freight and handling included, than foreign made trucks. This of course is due to standardized manufacturing methods which enable American truck makers to produce their trucks in great quantities. A few weeks ago the Stewart factory at Buffalo shipped 71 Stewart trucks abroad, 51 of them going to Cape Coast, Africa, and 20 to London, England."

At the present time the Stewart Motor Corporation has distributers in the leading cities of twenty-seven foreign countries.

EXPERIENCE BEHIND NASH.

In designing the new Nash Four the usual tests incidental to the production of any model were supplemented by the unusual manufacturing experience of C. W. Nash and of those associated with him in the Nash Motors Company.